

REMARKS

The Office Action dated October 19, 2004 has been carefully considered. Claims 1 and 4 have been amended. Claim 3 has been cancelled. Claims 1, 2 and 4 are in this application.

The previously presented claims were rejected under 35 U.S.C. § 112 as indefinite. Claims 1 and 4 have been amended to recite that the raw material is selected from the group consisting of propylene, propane, acrolein, isobutylene, methacrolein, xylene, naphthalene, benzene, and butane. Support for this amendment is found throughout the specification and in particular on page 21, lines 19-20. No new matter has been entered.

The previously presented claims were rejected under 35 U.S.C. § 103 as obvious in view of U.S. Patent No. 3,904,652 to Frank in combination with U.S. Patent No. 3,366,648 to Kerr. Applicants respectfully submit that the teachings of these references do not teach or suggest the invention defined by the present claims.

Frank discloses a recycle process producing maleic anhydride from n-butane using a phosphorous-vanadium-oxygen complex catalyst. Low oxygen concentration is used during the oxidation and recycling of off-gas from the reactor effluent scrubber. The oxygen is maintained below the flammable limit of the system. The limit depends on the temperature and the heat capacity of the gases in the reaction zone. In order to maintain the oxygen concentration below the lower limit, an inert gas is added to the process. In the case where nitrogen is used as the diluent, the oxygen concentration must be below 13%, the flammable limit for the butane-oxygen nitrogen system. See col. 3, lines 57-67.

In contrast to the invention defined by the present claims, Frank does not disclose any steps used during starting up of a reactor causing a raw material and the molecular oxygen-containing gas to pass a range in which the concentration of said raw material (excluding the concentration of said raw material at 0 vol. %) is less than the concentration of the lower explosion limit of said raw material and the concentration of oxygen is not less than the limiting oxygen concentration. Rather, Frank only relates to maintaining the oxygen below a flammable limit of the system during oxidation and

during recycling. However, there is no teaching or suggestion in Frank of causing both a raw material and a molecular oxygen-containing gas to respectfully pass a range in which the concentration of the raw material is lower than the concentration of the lower explosion limit of the raw material and the concentration of the oxygen is not less than a limiting oxygen concentration. Instead, Frank is similar to related art teachings of oxygen below a flammable limit, as shown in Fig. 4 of the present specification. Further, Frank does not disclose or suggest a step for reaching steady state causing a range in which the concentration of the raw material is less than the concentration of the lower explosion limit of the raw material and the concentration of oxygen is less than the limiting oxygen concentration.

Kerr discloses a method for production of maleic anhydride at high yields for prolonged periods of time comprising contacting an aliphatic hydrocarbon containing at least 70 wt % butene-1, butene-2, butadiene-1,3 or mixtures thereof in the vapor phase at elevated temperatures with oxygen and a vanadium-phosphorous catalyst complex. The gaseous feed stream to the oxidation reactions normally will contain air and about 0.5 to about 2.5 mol percent hydrocarbons such as butane. About 1.0 to about 1.5 mol percent of the monoolefin is satisfactory for optimum yield of product for the process of this invention. See col. 5, lines 69-73.

In contrast to the invention defined by the present claims, Kerr does not disclose any steps used during starting up a reactor causing a raw material and the molecular oxygen-containing gas to pass a range in which the concentration of said raw material (excluding the concentration of said raw material at 0 vol. %) is less than the concentration of the lower explosion limit of said raw material and the concentration of oxygen is not less than the limiting oxygen concentration. In contrast, Kerr only teaches steady state, but does not teach or suggest steps to be used during starting up a reactor. In addition, Kerr does not disclose or suggest a step for reaching steady state causing a range in which the concentration of said raw material is less than the concentration of the lower explosion limit of the raw material and the concentration of oxygen is less than the limiting oxygen concentration.

Accordingly, both references do not disclose or suggest how to start up a reactor,

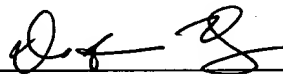
especially by causing a raw material to be oxidized and a molecular oxygen-containing gas to pass a range in which the concentration of the raw material is less than the concentration of the lower explosion limit of the raw material and the concentration of oxygen is not less than the limiting oxygen concentration, but excluding the concentration of said raw material of 0 vol. %, and ii) then for reaching steady state causing a range in which the concentration of the raw material is less than the concentration of the lower explosion limit of the raw material and the concentration of oxygen is less than the limiting oxygen concentration, thereby reaching the steady state.

Accordingly, the invention defined by the present claims is not obvious in view of Frank in combination with Kerr.

The application is now believed to be in a condition for allowance and an early notification thereof is respectfully requested. The Examiner is invited to contact the undersigned should he believe this would expedite prosecution of this application. It is believed no fee is required. The Commissioner is authorized to charge any deficiency or credit any overpayment to Deposit Account No. 13-2165.

Respectfully submitted,

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